NOTES for LLNL List of Controlled Carcinogens for Laboratories

1. The most common name is used first, than synonyms.
2. This is an incomplete list of materials that can penetrate through the skin and exert harmful effects at other locations. Only materials acknowledged as being hazardous in this manner by ACGIH are listed. Many other compounds are probably also hazardous in this manner.
3. Any substance contacting the skin can potentially harm the skin.
4. Key:
   - .1003—One of a set of carcinogens regulated by OSHA in the early 1970s for which no Occupational Exposure Limit (OEL) was developed. These are now addressed by a regulation for carcinogens, 29 CFR 1910.1003. There is almost invariably a hyphen in the adjacent OSHA PEL column and to the left in the TLV column which implies that exposures shall be minimized or eliminated.
   - .1xyz—A material covered by an OSHA substance specific regulation, 29 CFR 1910.1xyz. The OEL will be listed in the next column.
   - 1926.1000—The OSHA regulation for asbestos in the construction industry which includes common building / plumbing work.
   - No listing, but an OEL is listed in the next column—OSHA has an air contamination limit for it in their general guidance for air contaminants, 29 CFR 1910.1000.
5. Most OSHA OELs date back to 1968 and are often obsolete. See the TLV column for current guidance. Exception: Substances covered by substance specific standards, 29 CFR 1910.1xyz, and the carcinogens standard, 29 CFR 1910.1003.
6. The OEL listed is the maximum average concentration a working person can be exposed to throughout an eight-hour shift. The letter "C" appears next to one listing. This comes from the word "ceiling" and it is the maximum concentration of an air contaminant a person can be exposed to, even for brief exposures. There are other air contamination limits based on different exposure durations—ask your area Industrial Hygienist for guidance.
7. ACGIH A1 and A2 carcinogens are listed. Some select carcinogens have lower ACGIH ratings that are put in parentheses. The ACGIH ratings are:
   - A1—Confirmed Human Carcinogen—based on epidemiology. Basis for air contamination limit.

- A2—Suspected Human carcinogen—based on strong animal or inconsistent human data. Basis for air contamination limit.
- A3—Confirmed Animal carcinogen with Unknown Relevance to Humans—animal doses were high or by mechanisms irrelevant to humans; epidemiology does not support assertion of carcinogenicity; available evidence suggests substance will not cause cancer in realistic levels or routes of exposure.
- A4—Not Classifiable as a Human Carcinogen—Not classifiable due to lack of data; in vitro data unsupported by in vivo / epidemiology data.
- A5—Not Suspected as a Human Carcinogen—based on epidemiology or evidence of a lack of animal carcinogenicity supported by mechanistic data. A clearly negative assessment.

8. The OEL listed is the maximum average concentration a working person can be exposed to throughout an eight hour shift. There are other air contamination limits based on different exposure durations—ask your area Industrial Hygienist for guidance.
9. The National Toxicology Program will not rate a substance without substantial reason to be believe it is a carcinogen or potential carcinogen. They rate drugs and medical treatments which are included for completeness. So they have only two ratings:
    - Known To Be Human Carcinogens: This list includes agents, substances, mixtures, and medical treatments that are known to be carcinogenic in humans. These are numbered "1" in the NTP column.
    - Reasonably Anticipated To Be Human Carcinogens: This list includes agents, substances, and mixtures that are Reasonably Anticipated To Be Human Carcinogens. These are numbered "2" in the NTP column.
10. Only substances classified as Group 1, 2A, and 2B by IARC are listed. Some select carcinogens have lower IARC ratings and these are shown in parentheses. They rate drugs and medical treatments which are included for completeness. The IARC ratings are defined as follows:
    - Group 1: The agent (mixture) is carcinogenic to humans. The exposure circumstance entails exposures that are carcinogenic to humans.
    - Group 2A: The agent (mixture) is probably carcinogenic to humans. The exposure circumstance entails exposures that are probably carcinogenic to humans.

- Group 2B: The agent (mixture) is possibly carcinogenic to humans. The exposure circumstance entails exposures that are possibly carcinogenic to humans.
- Group 3: The agent (mixture, or exposure circumstance) is unclassifiable as to carcinogenicity in humans.
- Group 4: The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

11. Could be formed by strongly heating ABS polymer.
12. Employee personal breathing zone air sampling *required* by the cited OSHA standard.
13. See "Safe Handling of Asbestos-Containing Material during Construction Work" (H&SM S21.19) in Volume II of the *ES&H Manual* for guidance.
14. Soots and tars have been known carcinogens since 1775 when scrotal cancer was identified among chimney sweeps as an occupational disease. The carcinogenicity rating bodies are now addressing these mixtures. NTP rated 15 polyaromatic hydrocarbons (PAHs) as Reasonably Anticipated carcinogens. PAHs are present in the tars left after the destructive distillation (anaerobic heating) of coal to produce coke in coke ovens. This is why OSHA regulates exposures to coal tars in 29 CFR 1910.1029. Exposures to tars and soots, defined as the products of incomplete combustion or the products of strong anaerobic heating processes similar to the destructive distillation of coal, such as coal gassification, shall be reviewed by the area ES&H team. Air and surface samples may be needed as part of the evaluation. These samples can be analyzed by chemical and/or biological (Ames/*Salmonella* assay) means.
15. See "Safe Handling of Beryllium and Its Compounds" (H&SM S21.10) in Volume II of the *ES&H Manual*. Beryllium is the subject of special controls according to 10 CFR 850.
16. The OSHA regulation is based on avoiding known reproductive effects.
17. See H&SM S21.10 of the *ES&H Manual* for guidance. The OSHA standard is based on avoiding a host of adverse effects, some known for centuries.
18. Found in some two-component adhesives.
19. The non-PAH ingredients are addressed by a TLV of 5 mg/m^3, but it is proposed to address the PAHs with a TLV of 5 µg/m^3.
20. Listed here for comparison purposes only.
21. These are in widespread specialty use as insulators for furnaces, copper lasers, and other special applications. Control of exposures from maintenance actions or other

uses which could create airborne fibers with these shall be addressed by at least a Hazard Analysis and Control form. The application usually precludes using wet methods during fabrication, although wet methods can be used for clean up. Vacuum cleaners shall have HEPA filters. The manufacturers of these products recommend handling them as though they were carcinogenic.

22. Could be formed by strongly heating polystyrene polymer.
23. Applies only to irritatingly strong concentrations.
24. Hazards Control is not available to resolve smoker / non smoker disputes or site smoking zones outside of buildings.
25. Could be formed by strongly heating PVC polymer.
26. See insoluble chromium(VI) compounds.

LLNL List of Controlled Carcinogens for Laboratories.

Compound[1]	CAS Number	[2,3]Skin Hazard	OSHA-regulated carcinogens[4,5]	OSHA PEL[6]	ACGIH A1 or A2 carcinogens[7]	TLV[8]	NTP carcinogens[9]	IARC carcinogens[10]
A-a-C (2-Amino-9H-pyrido[2,3-b]indole)	26148-68-5							2B
Acetaldehyde	75-07-0			200 ppm	(A3)	25 ppm C	2	2B
Acetamide	60-35-5							2B
2-Acetylaminofluorene	53-96-3		.1003				2	
Acrylamide	79-06-1						2	2A
Acrylonitrile[11]	107-13-1	X	.1045[12]	2 ppm	A2	2 ppm	2	2B
Adriamycin	23214-92-8							2A
AF-2 [2-(2-Furyl)-3-(5-nitro-2-furyl)acrylamide]	3688-53-7							2B
Aflatoxins	6795-23-9						1	1
1-Amino-2-methylanthraquinone	82-28-0						2	(3)
2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP)	105650-23-5							2B
2-Amino-3-methyl-9H-pyrido[2,3-b]indole) (MeA-a-C)	68006-83-7							2B
2-Amino-3,4-dimethylimidazo[4,5-f]quinoline (MeIQ)	77094-11-2							2B
2-Amino-3,8-dimethylimidazo[4,5-f]quinoxaline MeIQx	77500-04-0							2B
2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole	712-68-5							2B

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Glu-P-1 (2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole)	67730-11-4							2B
2-Aminonaphthalene (2-naphthylamine)	91-59-8						1	
2-Aminoanthraquinone	117-79-3						2	
para-Aminoazobenzene	60-09-3							2B
ortho-Aminoazotoluene	97-56-3							2B
4-Aminodiphenyl	92-67-1		.1003		A1		1	1
Amitrole	61-82-5				(A3)	0.2		2B
ortho-Anisidine	90-04-0							2B
ortho-Anisidine hydrochloride	134-29-2						2	
Antimony trioxide	1309-64-4			0.5 mg / m^3	(A2, but only for production)	0.5 mg / m^3 (no value for trioxide		2B
Aramite®	140-57-8							2B
Arsenic, inorganic	7440-38-2 (metal)		.1018[12]	10 ug / m^3	A1	0.01 ug / m^3	1	1
Asbestos[13]			.1001, 29 CFR 1926. 1000	0.1 fibers / cc	A1	0.1 fibers / cc	1	1
Atrazine	1912-24-9							
Azacitidine	320-67-2						2	*2A*
Azaserine	115-02-6							2B
Azathioprene	446-86-6							1
Barbituric acid, 5-ethyl-5-phenyl (Phenobarbitol)	50-06-6							2B

Compound[1]	**CAS Number**	**[2,3]Skin Hazard**	**OSHA-regulated carcinogens[4,5]**	**OSHA PEL[6]**	**ACGIH A1 or A2 carcinogens[7]**	**TLV[8]**	**NTP carcinogens[9]**	**IARC carcinogens[10]**
Benzene	71-43-2	X	.1028[12]	1 ppm	A1	0.5 ppm	1	1
Benzidine (and salts)	92-87-5 for benzidine	X	.1003		A1		1	1 for benzidine, 2A for benzidine based dyes
Benzo(a)anthracene[14]	56-55-3		.1029	150 ug / m^3	A2	5 ug / m^3	2 under Polycyclic Aromatic Hydrocarbons, 14 Listings	2A
Benzo(a)pyrene[14]	50-32-8		"	"	"	"	"	2A
Benzo[b]fluoranthene[14]	205-99-2		"	"	"	"	"	2B
Benzo[j and k]fluoranthene[14]	205-82-3 and 207-08-9, respectivly		"	"	A2 both	5	2 both under Polycyclic Aromatic Hydrocarbons,[14]	2B
Benzofuran	271-89-6							2B
Benzotrichloride (see alpha-chlorinated toluenes entry	98-07-7	X			A2	0.1 C	2	
Benzyl violet	1694-09-3							2B
Beryllium and compounds[15]	7440-41-7 (metal)			2 ug / m^3	A1	2 ug / m^3 0.2 ug / m^3 proposed	2, includes BeO , $Be(OH)_2$, $BeSO_4$, $Be3(PO_4)_2$, beryllium-zinc silicate, beryl ore, and Be:Al alloys	1
N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine)	494-03-1							1

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Bischloroethyl nitrosourea (BCNU)	154-93-8							2A
Bitumens, extracts of steam-refined and air-refined	8052-42-4							2B
Bleomycins	11056-06-7							2B
Bracken fern								2B
Bromodichloromethane	75-27-4							2B
1,3-Butadiene[12]	106-99-0		.1051[12]	1 ppm	A2	2 ppm	2	2A
1,4-Butanediol dimethanesulfonate (Busulphan; Myleran)	55-98-1						1	1
Butylated hydroxyanisole (BHA)	25013-16-5						2	2B
beta-Butyrolactone	3068-88-0							2B
Cadmium	7440-43-9 metal		.1027[12]	5 ug/m^3	A2	0.01 mg/m^3 (Cd) 0.002 mg/m^3 (compounds)	2, includes Cd, CdCl2, CdO, CdSO4, and CdS	1, with compounds; welding rated a 2B activity
Calcium chromate	13765-19-0			0.1 mg/m^3	A1	0.05 mg/m^3		1
Caffeic acid	331-39-5							2B
Captafol	2425-06-1							2A
Carbon black	1333-86-4			3.5 mg/m^3	(A4)	3.5 mg/m^3		2B
Carbon tetrachloride	56-23-5	X		10 ppm	A2	10 ppm		2B
Carrageenan, degraded	9000-07-1							2B
Catechol	120-80-9				(A3)	5		2B
para-Chloro-ortho-toluidine	95-69-2						2	2A
Chlorambucil	305-03-3						1	1
para-Chloroaniline	106-47-8							2B

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Chloramphenicol	56-75-7							2A
Chlordane	57-74-9	X		0.5 mg / m^3	(A3)	0.5 mg / m^3		2B
Chlorendic acid	115-28-6						2	2B
Chlorinated paraffins (C12, 60% Chlorine)	108171-26-2						2	
alpha-Chlorinated toluenes (benzal chloride, benzotrichlor-ide, benzyl chloride, and benzoyl chloride (combined exposures)	98-87-3, 98-07-7, 100-44-7, and 98-88-4, respectively							2A
1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU)	13010-47-4							2A
1-(2-Chlor-oethyl)-3-(4-methylcyclohexyl)-1-nitro-sourea (MeCCNU)	13909-09-6						1	1
Chloroform	67-66-3			50 ppm C	(A3)	10 ppm	2	2B
bis(Chloromethyl) ether	542-88-1		.1003		A1	0.001 ppm	1	1
Chloromethyl methyl ether	107-30-2		.1003		A2		1	1
1-Chloro-2-methylpropene	513-37-1							2B
3-Chloro-2-methylpropene	563-47-3						2	(3)
Chlorophenoxy herbicides (2,4-D, 2,4,5-T, "Agent Orange")								2B
2,4-D (Dichlorophenoxyacetic acid)	94-75-7			10 mg / m^3	(A4)	10 mg / m^3		
2,4,5-T (2,4,5-trichloro-phenoxyace-tic acid)	93-76-5			10 mg / m^3	(A4)	10 mg / m^3		
4-Chloroorthophenylene-diamine	95-83-0							2B

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Chloroprene	126-99-8	X		25 ppm		10 ppm		2B
Chlorothalonil	1897-45-6						2	2B
para-Chloro-ortho-toluidine and its strong acid salts	95-69-2						2	2A
p-Chloro-ortho-toluidine hydrochloride	3165-93-3						2	
Chlorozotocin	54749-90-5						2	2A
Chromium (VI) compounds:							1	1
Water soluble (not otherwise specified),				0.1 mg/m^3	A1	0.05 mg/m^3		
Insoluble compounds				1 mg/m^3	A1	0.1 mg/m^3		
Chrysazin (danthron, 1,8-dihydroxyanthraquinone)	117-10-2						2	2B
CI Acid Red 114	6459-94-5							2B
CI Basic Red 9, Basic fuchsin and its monohydrochloride	569-61-9						2	2B
CI Solvent Orange 2 (Oil Orange SS)	2646-17-5							2B
CI Direct Blue 14 (Trypan blue)	72-57-1							2B
CI Direct Blue	2429-74-5							2B
Ciclosporin	79217-60-0							1
Cisplatin	15663-27-1						2	2A
Citrus Red No. 2	6358-53-8							2B

Compound[1]	CAS Number	[2,3]Skin Hazard	OSHA-regulated carcinogens[4,5]	OSHA PEL[6]	ACGIH A1 or A2 carcinogens[7]	TLV[8]	NTP carcinogens[9]	IARC carcinogens[10]
Coal gassification[14]								1, rated 1 as a process; see also coal tars and coal tar pitches, soots, and shale oils
Coal dust (anthracite or bituminous)				Varies	A2, change proposed in 1998	0.4 mg / m^3 (anthracite) 0.9 mg / m^3 (bituminous)		
Coal tars and coal tar pitches				0.2 mg / m^3			1 with Soots, Tars, and Mineral Oils	1, also for soots and shale oils
Coal tar pitch volatiles[14]	65996-93-2		.1029	150 ug / m^3	A1	0.2 mg / m^3	1, as coke oven emissions, coal tar, mineral oil, and soots	1, as coke oven emissions
Cyclophosphamide	50-18-0							1
Cobalt (metal, dust and fumes)	7440-48-4				(A3)	0.02 mg / m^3		2B
Creosotes	8001-58-9						1	2A
para-Cresidine	120-71-8						2	2B
Cupferron	135-20-6						2	
Cycasin	14901-08-7							2B
Cyclophosphamide	50-18-0						1	1
Dacarbazine	79217-60-0						2	2B
Daunomycin	20830-81-3							2B

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DDT (dichlorodiphenyltrichloroeth-ane)	p,p'-DDT, 50-29-3			1 mg/m^3	(A3)	1 mg/m^3		2B
N,N'-Diacetylbenzidine	613-35-4							2B
2,4-Diaminoanisole	615-05-4							2B
2,4-Diaminoanisole sulfate	39156-41-7						2	
Diaminodiphenyl ether (4,4-oxy-dianiline)	101-80-4						2	2B
2,4-Diaminotoluene (2,4-toluene-diamine)	95-80-7							2B
Diazomethane	384-88-3			0.2 ppm	A2	0.2 ppm		(4) Reviewed in 1987
Dibenz[a,h]acridine[14]	226-36-8		.1029	150 ug/m^3			2 under Polycyclic Aromatic Hydrocarbons, 14 Listings	2B
Dibenz[a,j]acridine[14]	224-42-0		"	"			"	2B
Dibenz[a,h] anthracene[14]	53-70-3		"	"			"	2A
Dibenzo[a,e] pyrene[14]	192-65-4		"	"			"	2B
Dibenzo[a,h] pyrene[14]	189-64-0		"	"			"	2B
Dibenzo[a,i] pyrene[14]	189-55-9		"	"			"	2B
Dibenzo[a,l] pyrene[14]	191-30-0		"	"			"	2B
7H-Dibenzo[c,g] carbazole[14]	194-59-2		"	"			"	2B
1,2-Dibromo-3-chloropropane (DBCP)[16]	96-12-8		.1044 (for reproductive effects)	1 ppb			2	2B

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para-Dichlorobenzene	106-46-7				(A3)	10	2	2B
3,3'-Dichlorobenzidine	91-94-1	X	.1003 includes its salts				2	2B
3,3-Dichlorobenzidine dihydrochloride	612-83-9						2	
1,4-Dichloro-2-butene	764-41-0				A2	0.005		
3,3'-Dichloro-4,4'-diamin-odiphenyl ether	28434-86-8							2B
1,2-Dichloroethane (ethylene dichloride)	107-06-2				(A4)	10	2	2B
1,3-Dichloropropene (technical grade)	542-75-6	X			(A4)	1	2	2B
Dichlorvos	62-73-7				(A4)	0.9		2B
Diepoxybutane	1464-53-5						2	
Diesel exhaust particulate[14]					A2	0.15		2A
Diesel fuel, marine	77650-28-3							2B
Di(2-ethylhexyl) phthalate (DEHP, DOP)	117-81-7				(A3)	5 mg/m^3	2	2B
Diethyl sulfate	64-67-5						2	2A
1,2-Diethyl hydrazine	1615-80-1							2B
Diethylstilbestrol	56-53-1						1	1
Diglycidyl resorcinol ether	101-90-6						2	2B
Dihydrosafrole	94-58-6							2B
Diisopropyl sulfate	2973-10-6							2B
3,3-Dimethoxybenzidine	116-90-4						2	2B
Dimethyl carbamoyl chloride	79-44-7				A2		2	2A

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4-Dimethylaminoazobenzene (xylidine)	60-11-7	X	.1003		(A3)	0.5 ppm	2	2B
2,6-Dimethylaniline (2,6-xylidine)	87-62-7							2B
1,1-Dimethylhydrazine (UDMH)	57-14-7	X		0.5 ppm	(A3)	0.01 ppm	2	2B
1,2-Dimethylhydrazine	540-73-8							2A
trans-2-[(Dimethylamino) methylimino]-5-[2-(5-nitro-2-furyl)-vinyl]-1,3,4-oxadiazole	25962-77-0							2B
Dimethyl sulfate	77-78-1	X		1 ppm	(A3)	0.1 ppm	2	2A
Dimethylvinylchloride (1-chloro-2-methylpropene)	513-37-1						2	2B
3,7-Dinitrofluoranthene	105735-71-5							2B
3,9-Dinitrofluoranthene	22506-53-2							2B
1,8-Dinitropyrene	42397-65-9						2	2B
2,4-Dinitrotoluene	121-14-2							2B
2,6-Dinitrotoluene	606-20-2							2B
1,4-Dioxane	123-91-1	X		100 ppm	(A3)	20 ppm proposed		2B
Direct Blue 6	2602-46-2						2	
Direct Black 38	1937-37-7						2	
Disperse Blue 1	2475-45-8						2	2B
Epichlorohydrin	106-89-8	X			(A3)	0.5 ppm	2	2A
1,2-Epoxybutane	106-88-7							2B
Erionite	66733-21-9						1, asbestos like structure	1

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Estradiol-17b (Unconjugated estrogens)	50-28-2						2	1, steroidal and non-steroidal estrogens both rated 1
Estrone, Ethinylestradiol (Unconjugated estrogens)	53-16-7 57-63-6						2	As above
Ethyl acrylate	140-88-5			25	(A4)	2 ppm	2	2B
Ethylene dibromide	106-93-4	X		20	(A3)		2	2A
Ethyleneimine (aziridine)	151-56-4	X	.1003		(A3)	0.5 ppm		2B
Ethylene oxide	75-21-8		.1047[12]	1 ppm	A2r	1 ppm		1
Ethylene thiourea	96-45-7						2	2B
Ethyl methanesulfonate	62-50-0						2	2B
N-Ethyl-N-nitrosourea	759-73-9						2	2A
Formaldehyde	50-00-0		.1048[12]	0.75 ppm	A2	0.3 ppm	2	2A
2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole	3570-75-0							2B
Furan	110-00-9						2	2B
Fusarium moniliforme toxins								2B
Gasoline					(A3)	300		2B
Gasoline engine exhaust								2B
Glycidol	556-52-5				(A3)	2	2	
Glycidaldehyde	765-34-4							2B
Griseofulvin	126-07-8							2B
HC Blue No. 1	2784-94-3							2B

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Heptachlor	76-44-8	X			(A3)	0.05		2B
Hexachlorobenzene	118-74-1	X			(A3)	0.002	2	2B
Hexachloroethane	118-74-1	X		1	(A3)	1	2	2B
Hexamethylphosphoramide	680-31-9	X			(A3)	—	2	2B
Hydrazine	302-01-2	X		1	(A3)	0.01	2	2B
Hydrazobenzene	122-66-7						2	
Indeno[1,2,3-cd]pyrene[14]	193-39-5		.1029	150	A2	5	2 under Polycyclic Aromatic Hydrocarbons, [14]	2B
Iron-dextran complex	9004-66-4						2	2B
Isoprene	78-79-5							2B
Kepone® (chlordecone)	143-50-0						2	2B
4-(N-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK)							2	2B
Lasiocarpine	303-34-4							2B
Lead and inorganic lead compounds[17]			.1025[12]	0.05 mg / m^3	(A3)	0.05 mg / m^3		2B
Lead acetate[17]	301-04-2		"	"	"	"	2	
Lead phosphate[17]	7446-27-7		"	"	"	"	2	
Lindane and other hexachloro-cyclohexane isomers	58-89-9	X		0.5 mg / m^3	(A3)	0.5 mg / m^3	2	
Magenta (containing CI Basic Red 9)	632-99-5							2B
Melphalan	148-82-3							1
Merphalan	531-76-0						2B	

Compound[1]	CAS Number	[2,3]Skin Hazard	OSHA-regulated carcinogens[4,5]	OSHA PEL[6]	ACGIH A1 or A2 carcinogens[7]	TLV[8]	NTP carcinogens[9]	IARC carcinogens[10]
Methoxsalen with Ultraviolet A Therapy (PUVA) (methoxsalen not carcinogenic alone	484-20-8						1	1
5-Methoxypsoralen	484-20-8						2A	
8-Methoxypsoralen (Methoxsalen) plus ultraviolet A radiation	298-81-7							1
2-Methylaziridine (propylen-imine)	75-55-8						2	2B
4,4-Methylenebis(2-chloraniline) (MBOCA, MOCA)	101-14-4	X			A2	0.01	2	2A
Methyl chloromethyl ether	107-30-2		.1003		A2			
Methylene chloride	75-09-2		.1052[12]	25 ppm	(A3)	50 ppm	2	2B
5-Methylchrysene[14]	3697-24-3		.1029	150 ug / m^3	A2	5 ug / m^3	2 under Polycyclic Aromatic hydro-carbons,[14]	2B
4,4'-Methylene bis(N,N-dimethyl)benzenamine	101-61-1						2	3
4,4-Methylenedianiline[18]	101-77-9	X	.1050[12]	10 ppb	(A3)	0.1 ppm	2	2B
Methyl-mercury compounds		X		0.01 mg / m^3 alkyl cmps		0.01 mg / m^3		2B
Methyl methanesulfonate	66-27-3						2	2A
4,4'-Methylene bis(2-meth-ylaniline)	838-88-0							2B
2-Methyl-1-nitroanthraquinone	129-15-7						2B	
N-Methyl-N-nitro-N-nitrosoguanidine (MNNG)	70-25-7						2	2A

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N-Methyl-N-nitrosourea (N-Nitroso-N-methylurea)	684-93-5						2	2A
N-Methyl-N-nitrosourethane	615-53-2							2B
Methylazoxymethanol acetate	592-62-1							2B
Methylthiouracil	56-04-2							2B
Metronidazole	443-48-1						2	2B
Michler's Ketone [4,4-(dimethylamino)benzo-phenone]	90-94-8						2	
Mineral oils[14,19]	8007-45-2						1 (with soots, tars, and mineral oils)	1 Mineral oils, (untreated and mildly treated) 3 (highly refined)
Mirex	2385-85-5						2	2b
Mitomycin-C	50-07-7							2B
Monocrotaline	315-22-0							2B
MOPP and other combined chemotherapy including alkylating agents								1
5-(Morpholinomethyl)-3-[(5-nitrofurfurylidene)amino]-2-oxazolidinone	3795-88-8							2B
Mustard gas (Sulfur mustard)	505-60-2							1
Nafenopin	3771-19-5							2B
1-Naphthylamine	134-32-7		.1003					3
2-Naphthylamine	91-59-8		.1003		A1	—	1	1
Nickel								

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Nickel, metallic	7440-02-0			1 mg/m^3	Non-carcinogen	1.5 mg/m^3	2	2B along with its alloys
Nickel, insoluble compounds				1 mg/m^3	A1,	0.2 mg/m^3		1, compounds only
Nickel, soluble compounds [20]				1 mg/m^3	(A4)	0.1 mg/m^3		
Nickel subsulfide	12035-72-2				A1	0.1 mg/m^3	2	1
5-Nitroacenaphthene	602-87-9							2B
o-Nitroanisole	91-23-6						2	2B
Nitrobenzene	98-95-3	X			A3	1 ppm		2B
Niridazole	61-57-4							2B
5-Nitroacenaphthene	602-87-9							
4-Nitrobiphenyl	92-93-3	X	.1003		A2			3
6-Nitrochrysene	7496-02-8						2	2B
Nitrofen (technical grade)	1836-75-5						2	2B
2-Nitrofluorene	607-57-8							2B
1-[(5-Nitrofurfurylidene)amino]-2-imidazolidinone	555-84-0							2B
N-[4-(5-Nitro-2-furyl)-2-thiazolyl]acetamide	531-82-8							2B
Nitrogen Mustard hydrochloride	55-86-7						2	
Nitrogen mustard	51-75-2							2A
Nitrogen mustard N-oxide	126-85-2							2B
Nitrilotriacetic acid and its salts	139-13-9						2	2B
2-Nitropropane	79-46-9				(A3)	10 ppm	2	2B
1-Nitropyrene	5522-43-0						2	2B
4-Nitropyrene	57835-92-4						2	2B

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N-Nitrosodi-n-butylamine	924-16-3						2	2B
N-Nitrosodiethanolamine	1116-54-7						2	2B
N-Nitrosodi-n-propylamine	621-64-7						2	2B
N-Nitrosodiethylamine (diethylnitrosamine; DEN)	55-18-5						2	2A
N-Nitrosodimethylamine (dimethylnitrosamine; DMN)	62-75-9	X	.1003		(A3)		2	2A
4-(N-Nitrosomethylamin-o)-1-(3-pyridyl)-1-butanone (NNK)	64091-91-4						2	2B
3-(N-Nitrosomethylamino) propionitrile	60153-49-3							2B
N-Nitrosomethylethylamine	10595-95-6							2B
N-Nitrosomethylvinylamine	4549-40-0						2	2B
N-Nitrosomorpholine	59-89-2						2	2B
N-Nitrosonornicotine	16543-55-8						2	2B
N-Nitrosopiperidine	100-75-4						2	2B
N-Nitrosopyrrolidine	930-55-2						2	2B
N-Nitrososarcosine	13256-22-9						2	2B
Norethisterone	68-22-4						2	
Ochratoxin A	303-47-9						2	2B
Oil mist (The 15 PAHs listed by NTP and listed here are measured)[14,20]					A1	0.005 mg / m^3	1 with soots, tars, and mineral oils	2B
Oxazepam	604-75-1							2B
Oxymetholone	434-07-1						2	
Panfuran S (containing dihydroxymethylfuratrizine)	794-93-4							2B

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Perchloroethylene (tetrachloroethylene)	127-18-4						2	2A
Phenacetin and analgesic mixtures containing it	62-44-2						2	2A
Phenazopyridine hydrochloride	136-40-3						2	2B
Phenoxybenzamine hydrochloride	63-92-3						2	2B
Phenyl glycidyl ether	122-60-1							2B
Phenytoin	57-41-0						2	2B
Polybrominated biphenyls (Firemaster BP-6, PBBs)	59536-65-1						2	2B
Polychlorinated biphenyls (Aroclors, Askarels, PCBs)	1336-36-3						2A	2B
PCBs, 42% chlorine (Chlorodiphenyls, Askarels, Intertene)		X			Not rated	1 mg/m^3		
PCBs, 54% chlorine (Chlorodiphenyls, Askarels, Intertene)		X			(A3)	0.5 mg/m^3		
Ponceau 3R	3564-09-8							2B
Ponceau MX	3761-53-3							2B
Potassium bromate	7758-01-2							2B
Procarbazine hydrochloride	366-70-1						2	2A
Progesterone	57-83-0						2	
1,3-Propane sultone	1120-71-4						2	2B
beta-Propiolactone	57-57-8		.1003		(A3)	0.5 ppm	2	2B
Propylene oxide	75-56-9						2	2B

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Propylthiouracil	51-52-5						2	2B
Reserpine	50-55-5						2	3
Refractory ceramic fibers (Saffil, Fiberfrax, etc., etc.) [21] See also synthetic vitreous fibers					A2	0.1 fiber / cc	2	2B
Silica, respirable								
Cristobalite	14464-46-1				Unrated	0.05 mg / m^3	2	1
Quartz	14808-60-7				A2 Proposed	0.1 mg / m^3	2	1
Tridymite	15468-32-3				Unrated	0.05 mg / m^3	2	1
Tripoli [20]	1317-95-9				"	0.1 mg / m^3		
Safrole	94-59-7						2	2B
Selenium and its compounds other than the sulfide	7782-49-2			0.2 mg / m^3		0.2 mg / m^3		(3) listed for comparison to sulfide
Selenium sulfide	7446-34-6					0.2 mg / m^3	2	
Shale oils[14]	68308-34-9							1, see also coal tars and coal tar pitches, coal gassification, and coal tar pitches, soots,
Silica—listed with synthetic vitreous fibers								
Sodium ortho-phenylphen-ate	132-27-4							2B
Soots, tars, and mineral oils[14]	8007-45-2						1	1

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Strontium chromate	7789-06-2			0.1 mg/m^3	See chromium (VI)		1	
Styrene[11,22]	100-42-5			100 ppm	(A4)	20 ppm		2A
Styrene-7,8-oxide	96-09-3							2A
Sulfallate (N,N-Diethyldithi-ocarbamic acid 2-chloroallyl ester)	95-06-7						2	2B
Sulfuric acid [23]	7664—93-9			1 mg/m^3	A2	3 mg/m^3		1, Rated 1 as a manufacturing process
Synthetic vitreous fibers							2 Glass wool	2B for glass wool, rock wool, and slag wool
Continuous filament glass fiber					(A4)	1 fiber/cc or 5 mg/m^3		
Glass wool					"	1 fiber/cc		
Rock wool					(A3)	"		
Slag wool					"	"		
Tamoxifen	10540-29-1							1, benefit of reducing risk of breast cancer acknowledged
Tars[14]	8007-45-2						1 with soots, tars, and mineral oils	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6						2	1
Tetranitromethane	509-14-8				(A3)	0.005 ppm	2	2B

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Thiotepa (tris(1-aziridinyl)phosphine sulfide)	52-24-4							1
Thiourea	62-56-6						2	
Thorium dioxide	1314-20-1						1	
Tobacco smoke[24]								1
Tobacco, smokeless								1
ortho-Tolidine (3,3'-Dimethylbenzidine)	119-93-7		.1003					2B
Toluene diisocyanate, isomer blends (TDI)	26471-62-5			0.02 ppm C	(A4)	0.005 ppm	2	2B
ortho-Toluidine	95-53-4	X			(A3)	2 ppm	2	2B
Toxaphene (Polychlorinated camphenes)	8001-35-2	X			(A3)	0.5 mg / m^3	2	2B
Treosulfan	299-75-2							1
Trichlormethine (Trimustine hydrochloride)	817-09-4							2B
Trichloroethylene (TCE)	79-01-6				Non-carcinogen	50 ppm		2A
1,2,3-Trichloropropane	96-18-4	X			(A3)	10 ppm	2	2A
Trp-P-1 (3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole)	62450-06-0							2B
Trp-P-2 (3-Amino-1-methyl-5H-pyrido[4,3-b]indole)	62450-07-1							2B
Uracil mustard	66-75-1							2B

Compound[1]	**CAS Number**	**[2,3]Skin Hazard**	**OSHA-regulated carcinogens[4,5]**	**OSHA PEL[6]**	**ACGIH A1 or A2 carcinogens[7]**	**TLV[8]**	**NTP carcinogens[9]**	**IARC carcinogens[10]**
Uranium (natural) Soluble and insoluble compounds	7440-61-1			50 ug/m^3 sol cmps 250 ug/m^3 insol compounds	A1	0.2 mg/m^3		
Urethane	51-79-6						2	2B
Vinyl bromide	593-60-2				A2	0.5 ppm		2A
Vinyl chloride[25]	75-01-4		.1017 a	1 ppm	A1	5 ppm (1 ppm proposed)	1	1
4-Vinylcyclohexene	100-40-3				(A3)	0.1 ppm		2B
4-Vinylcyclohexene diepoxide, vinyl cyclohexene dioxide	107-87-6	X			(A3)	0.1 ppm		2B
Welding fumes NOS[26]					Not rated	5 mg/m^3 (for mild steel or Al)		2B
Wood dust (certain hardwoods including beech and oak and hardwood/softwood mixtures)					A1	1 mg/m^3 (raise to 5 mg/m^3)		1, Rated 1 as a material NOS; also furniture/cabinet making rated 1 as an activity; carpentry and joinery rated a 2B activity
Zinc chromate[26]	13530-65-9, 11103-86-9, 37300-23-5			0.1 mg/m^3	A1	0.01 mg/m^3	1	1